

Virtual Colonoscopy

National Digestive Diseases Information Clearinghouse



What is virtual colonoscopy?

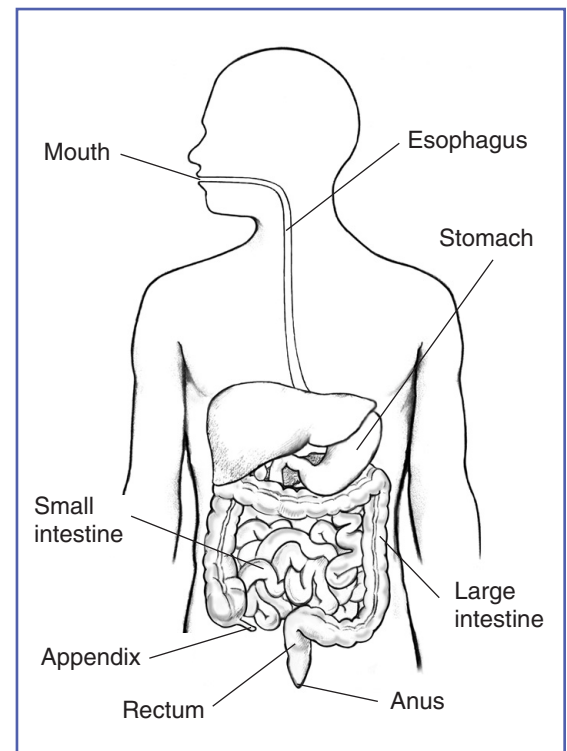
Virtual colonoscopy, also called computerized tomography (CT) colonography, is a procedure that uses a combination of x rays and computer technology to create images of the rectum and entire colon. Virtual colonoscopy can show irritated and swollen tissue, ulcers, and polyps—extra pieces of tissue that grow on the lining of the intestine.

This procedure is different from colonoscopy, which uses a long, flexible, narrow tube with a light and tiny camera on one end, called a colonoscope or scope, to look inside the rectum and entire colon. Read more in *Colonoscopy* at www.digestive.niddk.nih.gov.

What are the rectum and colon?

The rectum and colon are part of the gastrointestinal (GI) tract, a series of hollow organs joined in a long, twisting tube from the mouth to the anus, a 1-inch-long opening through which stool leaves the body. The body digests food using the movement of muscles in the GI tract, along with the release of hormones and enzymes. Organs

that make up the GI tract are the mouth, esophagus, stomach, small intestine, large intestine—which includes the appendix, cecum, colon, and rectum—and anus. The intestines are sometimes called the bowel. The last part of the GI tract—called the lower GI tract—consists of the large intestine and anus.



The GI tract

The large intestine is about 5 feet long in adults and absorbs water and any remaining nutrients from partially digested food passed from the small intestine. The large intestine then changes waste from liquid to a solid matter called stool. Stool passes from the colon to the rectum. The rectum is 6 to 8 inches long in adults and is located between the last part of the colon—called the sigmoid colon—and the anus. The rectum stores stool prior to a bowel movement. During a bowel movement, stool moves from the rectum to the anus.

Why is a virtual colonoscopy performed?

A virtual colonoscopy is performed to help diagnose

- changes in bowel habits
- abdominal pain
- bleeding from the anus
- weight loss

A gastroenterologist—a doctor who specializes in digestive diseases—may also order a virtual colonoscopy as a screening test for colon cancer. Screening is testing for diseases when people have no symptoms. Screening may find a disease at an early stage, when a gastroenterologist has a better chance of curing the disease. However, while some gastroenterologists use a virtual colonoscopy to screen for colon cancer, not

enough evidence exists to fully assess its effectiveness as a screening tool. Instead, the U.S. Preventive Services Task Force recommends fecal occult blood testing, sigmoidoscopy, or colonoscopy for colon cancer screening.¹

The American College of Gastroenterology recommends screening for colon cancer²

- at age 50 for people who are not at increased risk of the disease
- at age 45 for African Americans because they have an increased risk of developing the disease

A gastroenterologist may recommend earlier screening for people with a family history of colon cancer, a personal history of inflammatory bowel disease—a long-lasting disorder that causes irritation and sores in the GI tract—or other risk factors for colon cancer.

Medicare and private insurance companies sometimes change whether and how often they pay for cancer screening tests. People should check with their insurance company to find out how often they can get a screening virtual colonoscopy that their insurance will cover.

Read more about colon cancer at www.cancer.gov.

¹U.S. Preventive Services Task Force. *Screening for Colorectal Cancer: U.S. Preventive Services Task Force Recommendation Statement*. Rockville, MD: Agency for Healthcare Research and Quality; 2008. AHRQ Publication 08-05124-EF-3. Report.

²Rex DK, Johnson DA, Anderson JC, Schoenfeld PS, Burke CA, Inadomi JM. American College of Gastroenterology guidelines for colorectal cancer screening 2008. *American Journal of Gastroenterology*. 2009;104(3):739–750.

How does a person prepare for a virtual colonoscopy?

Preparation for a virtual colonoscopy includes the following steps:

- **Talk with a gastroenterologist.** When people schedule a virtual colonoscopy, they should talk with their gastroenterologist about medical conditions they have and all prescribed and over-the-counter medications, vitamins, and supplements they take, including
 - aspirin or medications that contain aspirin
 - nonsteroidal anti-inflammatory drugs such as ibuprofen or naproxen
 - arthritis medications
 - blood thinners
 - diabetes medications
 - vitamins that contain iron or iron supplements

Women should let their gastroenterologist know if they are pregnant. Developing fetuses are particularly sensitive to x rays. The x-ray technician should take special precautions to minimize exposure, or the gastroenterologist may suggest an alternative procedure, such as a colonoscopy.

- **Cleanse the bowel.** The gastroenterologist will give written bowel prep instructions to follow at home. A gastroenterologist orders a bowel prep so that little to no stool is present inside the person's intestine. A complete bowel prep lets the person pass stool that is clear. Stool inside the colon can prevent the CT scanner from taking clear images of the intestinal lining. Instructions may

include following a clear liquid diet for 1 to 3 days before the procedure and avoiding drinks that contain red or purple dye. The instructions will provide specific direction about when to start and stop the clear liquid diet. People may drink or eat the following:

- fat-free bouillon or broth
- strained fruit juice, such as apple or white grape—orange juice is not recommended
- water
- plain coffee or tea, without cream or milk
- sports drinks in flavors such as lemon, lime, or orange
- gelatin in flavors such as lemon, lime, or orange

The person needs to take laxatives and enemas the night before a virtual colonoscopy. A laxative is medication that loosens stool and increases bowel movements. An enema involves flushing water or laxative into the rectum using a special wash bottle. Laxatives and enemas can cause diarrhea, so the person should stay close to a bathroom during the bowel prep.

Laxatives are usually swallowed in pill form or as a powder dissolved in water. Some people will need to drink a large amount, usually a gallon, of liquid laxative at scheduled times. People may find this part of the bowel prep difficult; however, it is very important to complete the prep. The images will not be clear if the prep is incomplete.

People should call the gastroenterologist if they are having side effects that are preventing them from finishing the prep.

- **Drink contrast medium.** The night before the procedure, the person will drink a liquid that contains a special dye, called contrast medium. Contrast medium is visible on x rays and can help distinguish between stool and polyps.

How is a virtual colonoscopy performed?

A radiologist—a doctor who specializes in medical imaging—performs a virtual colonoscopy at an outpatient center or a hospital. A person does not need anesthesia.

For the test, the person will lie on a table while the radiologist inserts a thin tube through the anus and into the rectum. The tube inflates the large intestine with air for a better view. The table slides into a tunnel-shaped device where the radiologist takes the x ray images. The radiologist may ask the person to hold his or her breath several times during the test to steady the images. The radiologist will ask the person to turn over on the side or stomach so the radiologist can take different images of the large intestine. The procedure lasts about 10 to 15 minutes.

What can a person expect after a virtual colonoscopy?

After a virtual colonoscopy, a person can expect

- cramping or bloating during the first hour after the test
- to resume regular activities immediately after the test
- to return to a normal diet

After the test, a radiologist interprets the images, evaluates the results to find any abnormalities, and sends a report to the gastroenterologist. If the radiologist finds

abnormalities, a gastroenterologist may perform a colonoscopy the same day or at a later time.

Seek Help for Emergency Symptoms

People who have any of the following symptoms after a virtual colonoscopy should seek immediate medical attention:

- severe abdominal pain
- fever
- bloody bowel movements or bleeding from the anus
- dizziness
- weakness

What are the risks of virtual colonoscopy?

The risks of virtual colonoscopy include

- exposure to radiation
- perforation—a hole or tear in the lining of the colon

Radiation exposure can cause cancer. However, though the level of radiation exposure that leads to cancer is unknown, the risk from these types of tests is thought to be small. Inflating the colon with air has a small risk of perforating the intestinal lining. Perforation may need to be treated with surgery.

Virtual colonoscopy shows the entire abdomen—the area between the chest and the hips—and can show abnormalities outside of the GI tract. These findings may lead to additional testing, cost, and anxiety.

Work with a Gastroenterologist to Determine the Best Screening Method

Virtual colonoscopy has several advantages and disadvantages when compared with a colonoscopy. The advantages of virtual colonoscopy include the following:

- Virtual colonoscopy does not require the insertion of a colonoscope into the entire length of the colon.
- People do not need anesthesia. People can return to their normal activities or go home after the procedure without the help of another person.
- Virtual colonoscopy takes less time than colonoscopy.
- The radiologist can use a virtual colonoscopy to view the inside of a colon that is narrowed because of inflammation or the presence of a polyp.

The disadvantages of virtual colonoscopy include the following:

- People require bowel prep and the insertion of a tube into the rectum.
- The radiologist cannot remove tissue samples or polyps or stop bleeding if a perforation occurs.

- If a virtual colonoscopy shows a polyp or cancer, a colonoscopy may be needed to confirm or treat the abnormality; with a colonoscopy, treatment can occur at the same time as diagnosis.
- Virtual colonoscopy may not be as effective as colonoscopy at detecting certain polyps.
- Virtual colonoscopy may interfere with personal medical devices. People should tell the gastroenterologist about any implanted medical devices.
- Medicare and private insurance companies sometimes change whether and how often they pay for cancer screening tests. People should check with their insurance company to find out how often they can get a screening virtual colonoscopy that their insurance will cover.
- Virtual colonoscopy is a newer technology and not all medical facilities make this procedure available.
- Gastroenterologists do not recommend techniques that use x-ray radiation for pregnant women because the radiation may harm the fetus.

Points to Remember

- Virtual colonoscopy, also called computerized tomography (CT) colonography, is a procedure that uses a combination of x rays and computer technology to create images of the rectum and entire colon.
- Virtual colonoscopy can show irritated and swollen tissue, ulcers, and polyps—extra pieces of tissue that grow on the lining of the intestine.
- A virtual colonoscopy is performed to help diagnose
 - changes in bowel habits
 - abdominal pain
 - bleeding from the anus
 - weight loss
- A gastroenterologist may also order a virtual colonoscopy as a screening test for colon cancer.
- Preparation for a virtual colonoscopy includes talking with a gastroenterologist about medical conditions the person has and medications the person is taking, as well as cleansing the bowel.
- The gastroenterologist will give written bowel prep instructions to follow at home. A gastroenterologist orders a bowel prep so that little to no stool is present inside the person's intestine.
- The images will not be clear if the prep is incomplete.
- The night before the procedure, the person will drink a liquid that contains a special dye, called contrast medium. A radiologist—a doctor who specializes in medical imaging—performs a virtual colonoscopy at an outpatient center or a hospital. For the test, the person will lie on a table while the radiologist inserts a thin tube through the anus and into the rectum. The tube inflates the large intestine with air for a better view. The table slides into a tunnel-shaped device where the radiologist takes the x-ray images.
- The risks of virtual colonoscopy include exposure to radiation and perforation—a hole or tear in the lining of the colon.

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) conducts and supports basic and clinical research into many digestive disorders.

Clinical trials are research studies involving people. Clinical trials look at safe and effective new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. To learn more about clinical trials, why they matter, and how to participate, visit the NIH Clinical Research Trials and You website at www.nih.gov/health/clinicaltrials. For information about current studies, visit www.ClinicalTrials.gov.

For More Information

Read more about other diagnostic tests in these publications at www.digestive.niddk.nih.gov:

- *Colonoscopy*
- *ERCP (Endoscopic Retrograde Cholangiopancreatography)*
- *Flexible Sigmoidoscopy*
- *Liver Biopsy*
- *Lower GI Series*
- *Upper GI Endoscopy*
- *Upper GI Series*

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You may also find additional information about this topic by visiting MedlinePlus at www.medlineplus.gov.

This publication may contain information about medications and, when taken as prescribed, the conditions they treat. When prepared, this publication included the most current information available. For updates or for questions about any medications, contact the U.S. Food and Drug Administration toll-free at 1-888-INFO-FDA (1-888-463-6332) or visit www.fda.gov. Consult your health care provider for more information.

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The National Digestive Diseases Information Clearinghouse (NDDIC) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health of the U.S. Department of Health and Human Services. Established in 1980, the Clearinghouse provides information about digestive diseases to people with digestive disorders and to their families, health care professionals, and the public. The NDDIC answers inquiries, develops and distributes publications, and works closely with professional and patient organizations and Government agencies to coordinate resources about digestive diseases.

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